

PRENATAL PHTHALATE EXPOSURE AND NEURODEVELOPMENT AT 3 YEARS OF AGE (PILOT STUDY)

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Background and Aims: Prenatal exposure to phthalates has been negatively associated with neurodevelopment in the limited studies conducted to date, possibly due to their connection with altered thyroid signaling or other mechanisms. Different associations have been reported between boys and girls. The aim of this pilot study is to investigate the relationship between maternal urinary phthalate concentrations during pregnancy and children's neurodevelopment at 36 months of age.

Methods: Urinary phthalate metabolites (MEHP, MBzP, MEP, MBP, MCP, DEHP) and bisphenol A (BPA) were measured in 45 pregnant women at the third trimester of pregnancy; children's neurodevelopment was assessed using the mental development scores (MDI) from the Bayley Scales of Infant Development-II at 36 months of age (20 boys and 25 girls). The relationship between specific gravity-corrected prenatal phthalate concentrations and MDI was estimated using adjusted linear regression models stratified by sex.

Results: After the correction for urinary dilution and adjustment for potential confounders, an increase in log_e concentrations of MEHP and MBzP were associated with lower MDI scores in girls: MEHP: -5.53 (95%CI: -10.35, -0.71), MBzP: -5.11 (95%CI: -9.38, -0.84). The remaining phthalate metabolites and BPA were inversely associated with MDI but not statistically significant. There were no statistically significant associations between MDI and prenatal phthalate concentrations among boys.

Conclusions: A differential effect of prenatal phthalates exposure by gender was documented in this study in relation to neurodevelopment. MEHP and MBzP, high-molecular weight phthalates, were associated with a lower MDI in girls at 36 months of life. Further studies are needed with larger sample sizes to confirm these results.